NetApp with OpenStack
Win in OpenStack with the NetApp portfolio

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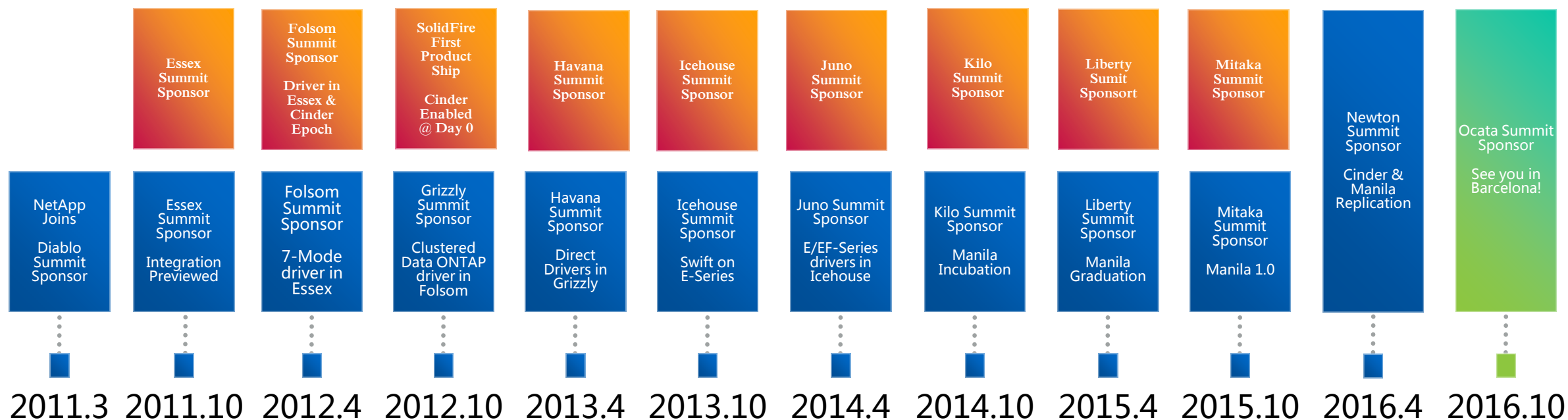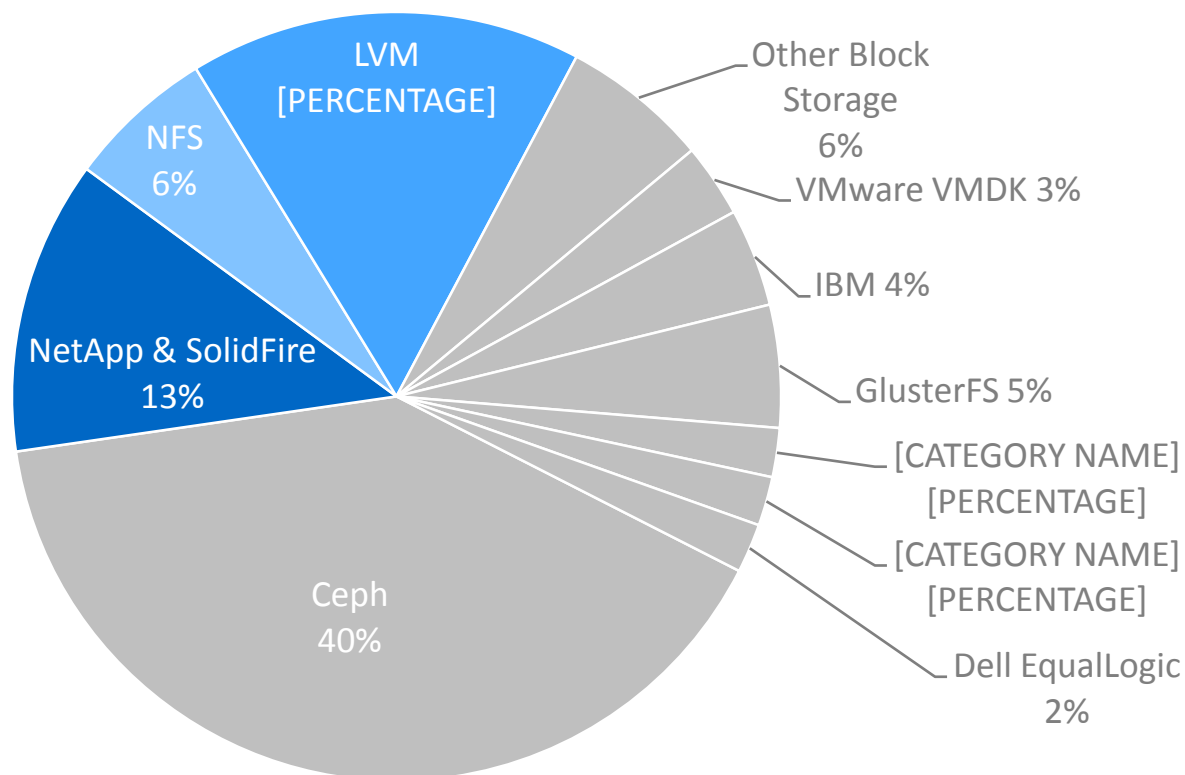# NetApp & OpenStack

NetApp and OpenStack介绍

- OpenStack Foundation:
  - Charter Gold Member
  - Elected board representation

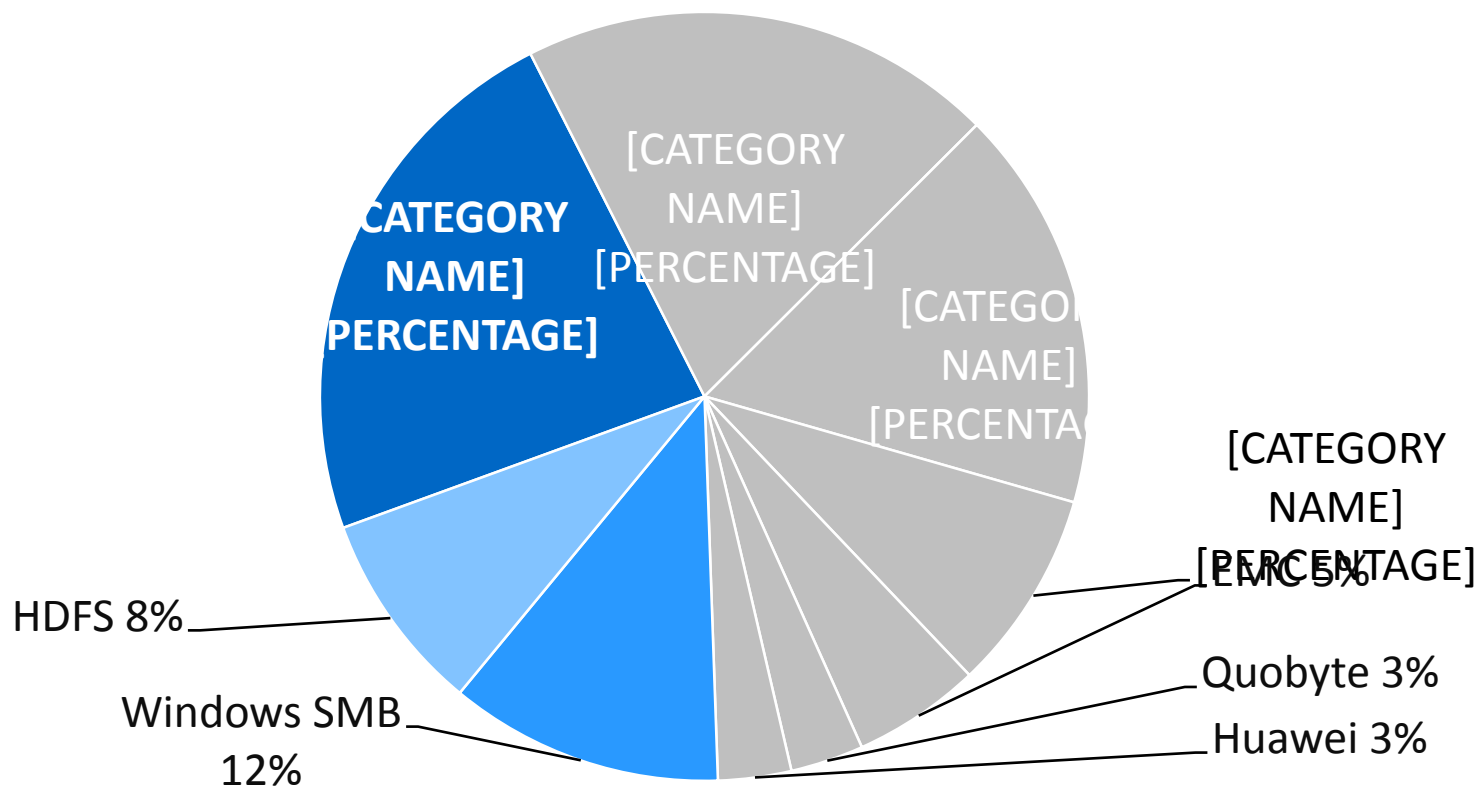- 1st and leading storage provider

- Community project leadership

	Essex Summit Sponsor	Folsom Summit Sponsor Driver in Essex & Cinder Epoch	SolidFire First Product Ship Cinder Enabled @ Day 0	Havana Summit Sponsor	Icehouse Summit Sponsor	Juno Summit Sponsor	Kilo Summit Sponsor	Liberty Sumit Sponsort	Mitaka Summit Sponsor	Newton Summit Sponsor Cinder & Manila Replication	Ocata Summit Sponsor See you in Barcelona!
NetApp Joins Diablo Summit Sponsor	Essex Summit Sponsor Integration Previewed	Folsom Summit Sponsor 7-Mode driver in Essex	Grizzly Summit Sponsor Clustered Data ONTAP driver in Folsom	Havana Summit Sponsor Direct Drivers in Grizzly	Icehouse Summit Sponsor Swift on E-Series	Juno Summit Sponsor E/EF-Series drivers in Icehouse	Kilo Summit Sponsor Manila Incubation	Liberty Summit Sponsor Manila Graduation	Mitaka Summit Sponsor Manila 1.0		
2011.3	2011.10	2012.4	2012.10	2013.4	2013.10	2014.4	2014.10	2015.4	2015.10	2016.4	2016.10

OpenStack Foundation 用户调研结果

Block Storage Drivers in Use (April 2016)

Pie chart: Block Storage Drivers in Use (April 2016)
- LVM [PERCENTAGE]
- NFS 6%
- NetApp & SolidFire 13%
- Ceph 40%
- Other Block Storage 6%
- VMware VMDK 3%
- IBM 4%
- GlusterFS 5%
- [CATEGORY NAME] [PERCENTAGE]
- [CATEGORY NAME] [PERCENTAGE]
- Dell EqualLogic 2%

- With the addition of SolidFire, NetApp further consolidates its position as the leading commercial provider of OpenStack Block Storage.
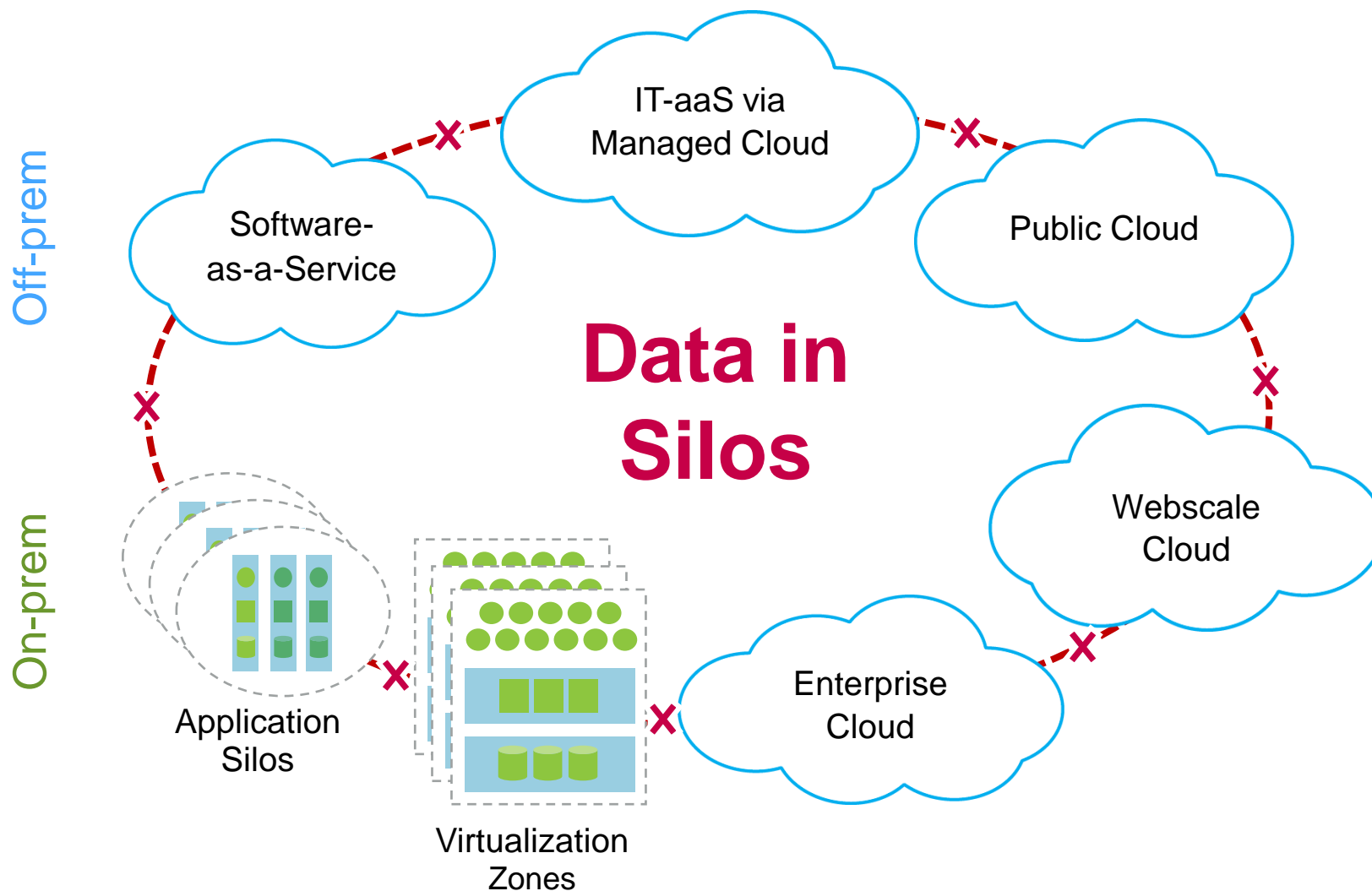
OpenStack Foundation 用户调研结果

Shared File System Drivers in Use (April 2016)

CATEGORY NAME] [PERCENTAGE]

[CATEGORY NAME] [PERCENTAGE]

[CATEGORY NAME] [PERCENTAGE]

[CATEGORY NAME] [PERCENTAGE]

EMC 5%

Quobyte 3%

Huawei 3%

HDFS 8%

Windows SMB 12%

- NetApp is the founder of, leading contributor to, and most widely deployed option for Manila

Data Fabric 助力数字化转型

The NetApp 产品组合

全闪产品介绍

EF

Streamlined architecture optimized for low-latency workloads

Speed

Standalone apps

Improve slow app response, reduce time to results

Ultra-low latency, low cost, direct-attach model

AFF

Performance, robust data management, shared general IT
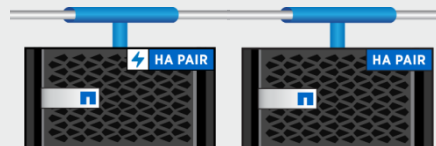
Data Services

Virtual infrastructure

Support variety of block and file applications

Unified multi-protocol storage with application integration

SolidFire

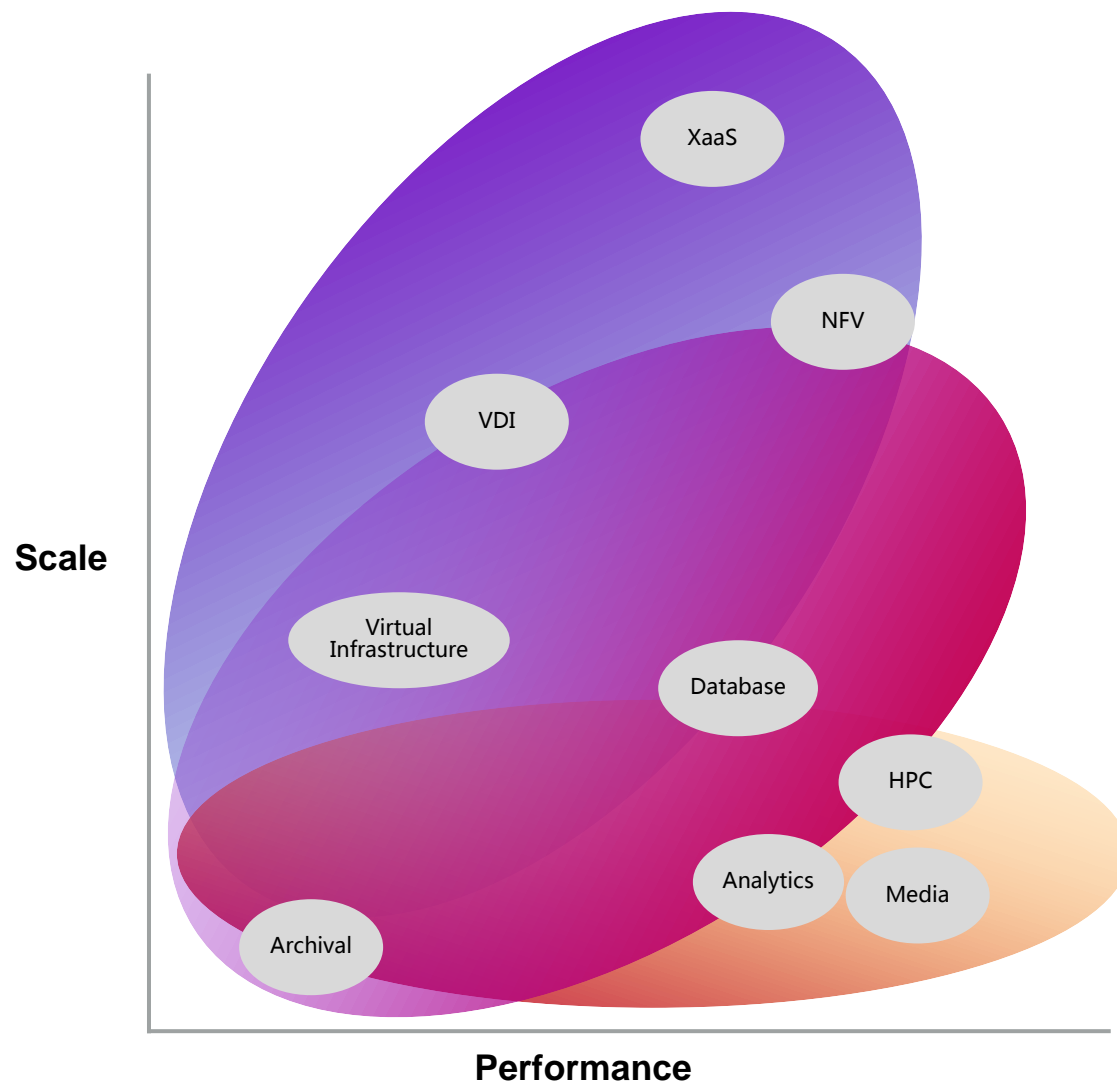Scale-out, service-oriented flash storage for next gen architectures

Scale

Cloud-like infrastructure

Performance control for multi-tenant environments
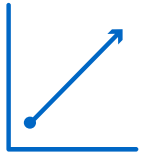
Guaranteed QoS to 1000s of apps

工作负载定位

SolidFire	Scale	Guaranteed QoS	Block
ONTAP®	Data Services	Unified, Multi-Protocol	Block, File, Image
E / EF-Series	Speed	Low latency, low cost	Block, Object

NetApp SolidFire & Cinder

The Predictable Performance Storage Choice for OpenStack Block Storage

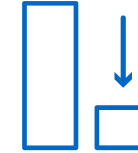**Granular,** non-disruptive scale

Predictable, guaranteed storage performance

Deep automation integration with management and orchestration platforms

Self-healing, shared-nothing data protection

Always-on global deduplication, compression and thin provisioning

SolidFire Cinder driver enables all OpenStack block storage features

Ability to set and maintain true QoS levels on a per-volume basis

Create, snap, clone and manage SolidFire volumes directly

Configure SolidFire as block storage back-end in under a minute

Eliminates arduous management layers between OpenStack and the storage system

SolidFire driver fully integrated into OpenStack - no additional features / licenses required
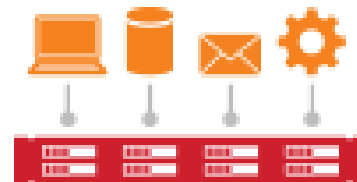
SolidFire 自动化方案
Native multi-tenant architecture, best-in-class orchestration integrations

Flexibility
- Dynamic resource pools
- Seamless scaling

Workload Consolidation
- Native multi-tenant design
- Application / tenant isolation

Control
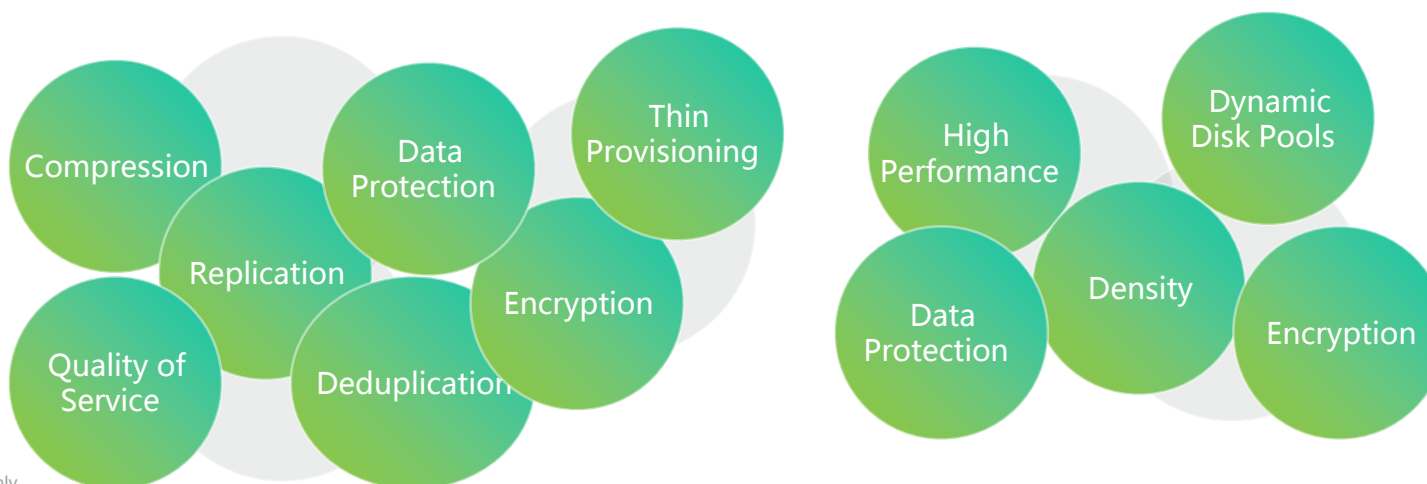- Control performance
- Control cost

Time to Value
- Rapid deployment
- Automated management

定义自己的块和文件存储的Marketplace

- Assemble diverse capabilities across platforms

- Define a catalog through Cinder and Manila

- Deliver unique NetApp® features directly to serve workload requirements

Cinder/Manila | Good | Better | Best | Critical

Compression
Data Protection
Thin Provisioning
Replication
Encryption
Quality of Service
Deduplication

High Performance
Dynamic Disk Pools
Data Protection
Density
Encryption
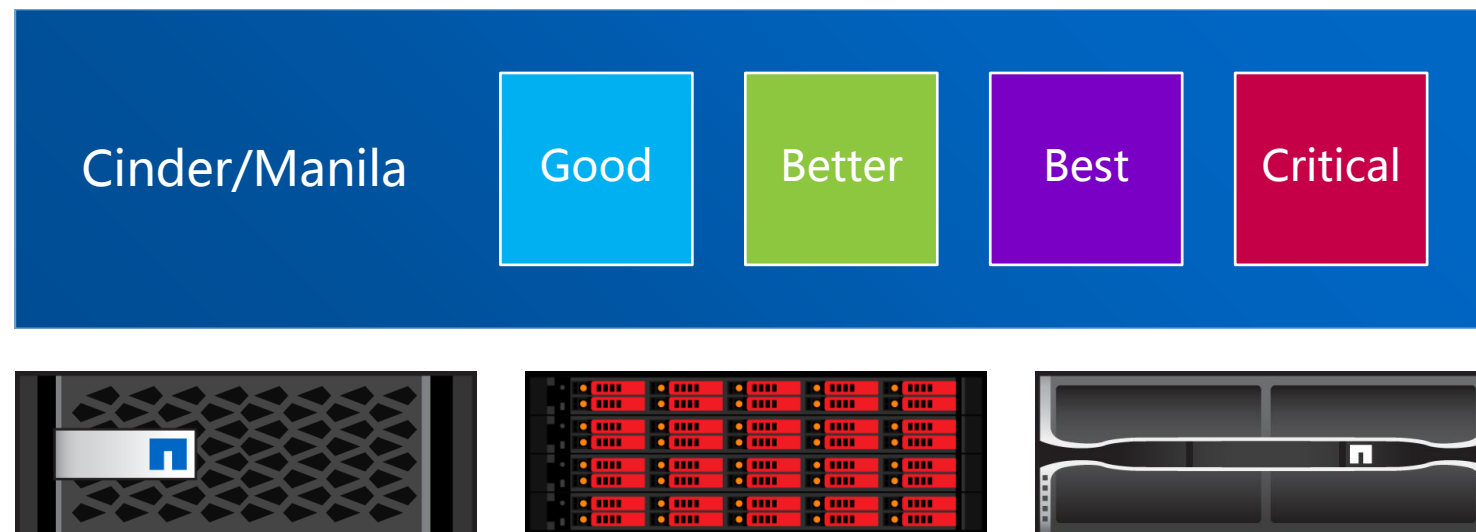
Manila

File Systems & Cloud Storage

OpenStack与共享文件系统

NetApp and Manila

Compute	Image	Block Storage	Object Storage	**File Systems**	Database Service	Analytics Service

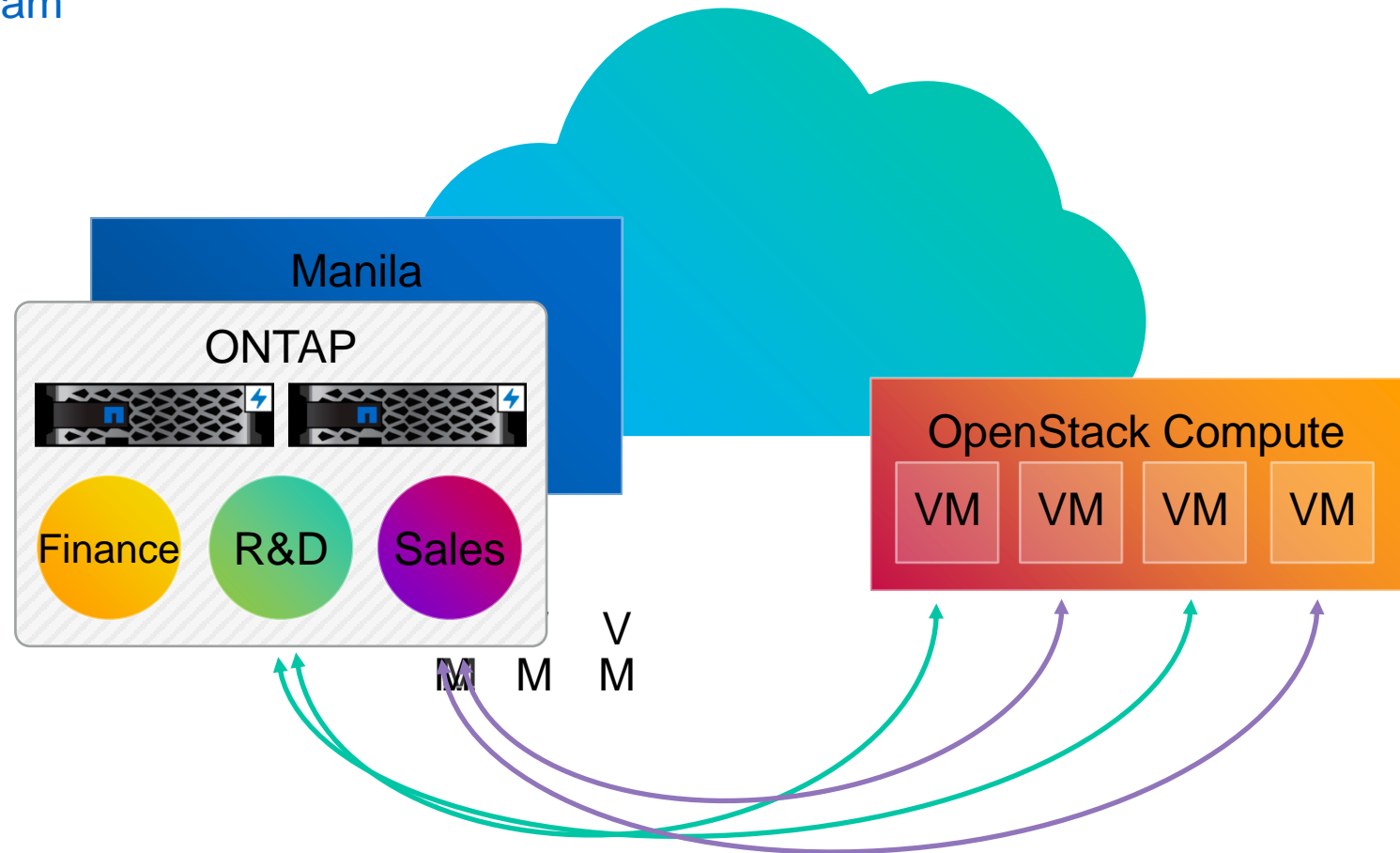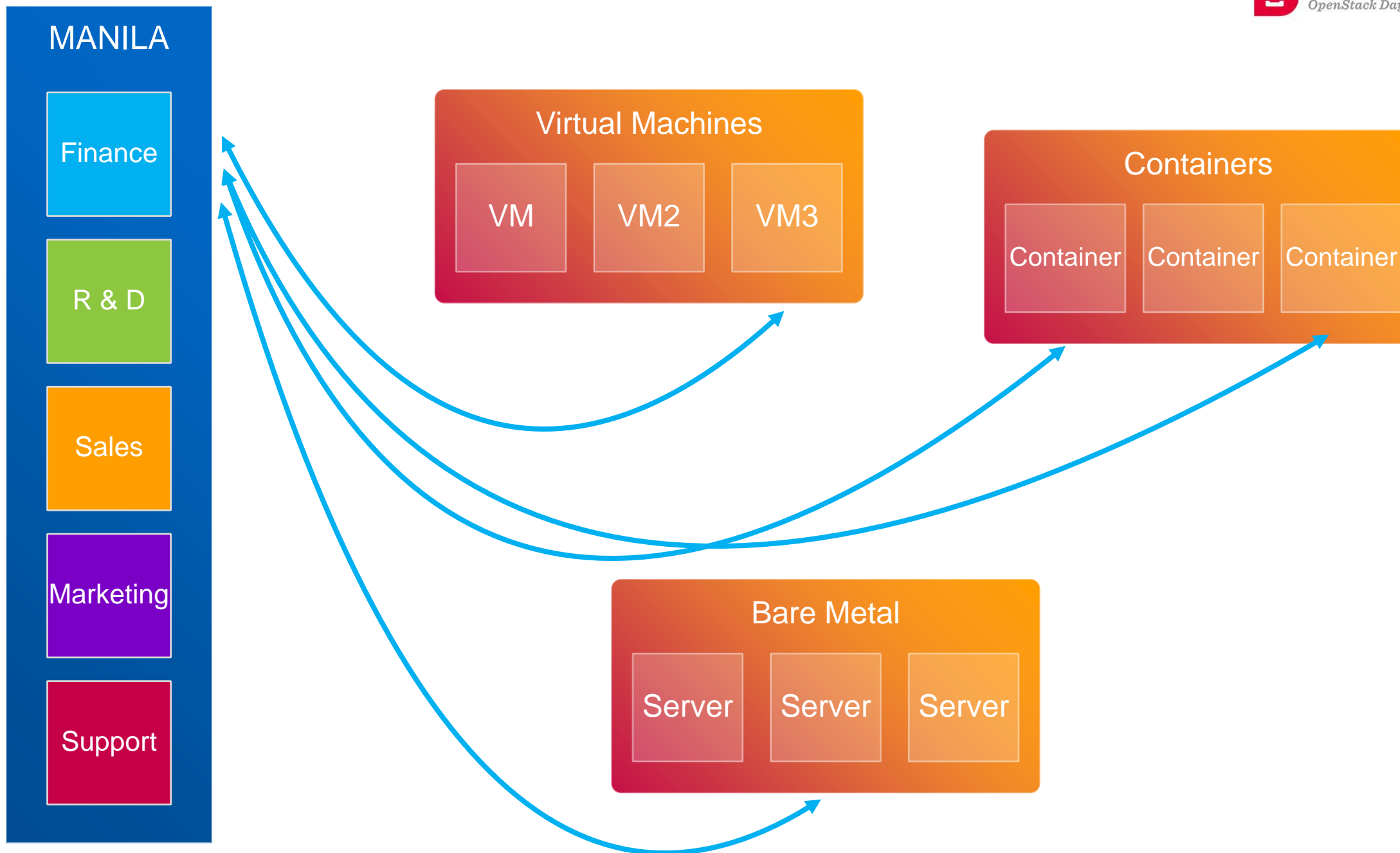| ONTAP®	SolidFire ®	E/EF-Series	StorageGRID®	AltaVault™	OCI
Manila			Manila		Manila

Manila:

The OpenStack Shared File Service Program

- **Manila delivers file systems as a service:**
  - NFS, CIFS, HDFS, and more

- **Production-ready in Liberty**

- **Supports a wide range of network topologies**

Manila

ONTAP

Finance   R&D   Sales

V M   M   V M

OpenStack Compute
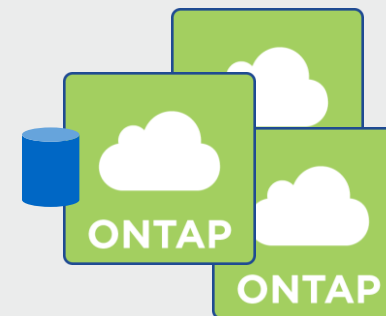
VM   VM   VM   VM

MANILA PROJECT

通过数据网格提供云端容灾方案

Private Cloud

Amazon Web Services

Tenant provisions primary or replica shares on premise or at AWS via Manila

Manila automates SnapMirror relationships & management to enable Hybrid Cloud DR

对象存储

NetApp OpenStack Integrations

OpenStack与对象存储

NetApp and Swift

	Compute	Image	Block Storage	Object Storage	File Systems	Database Service	Analytics Service

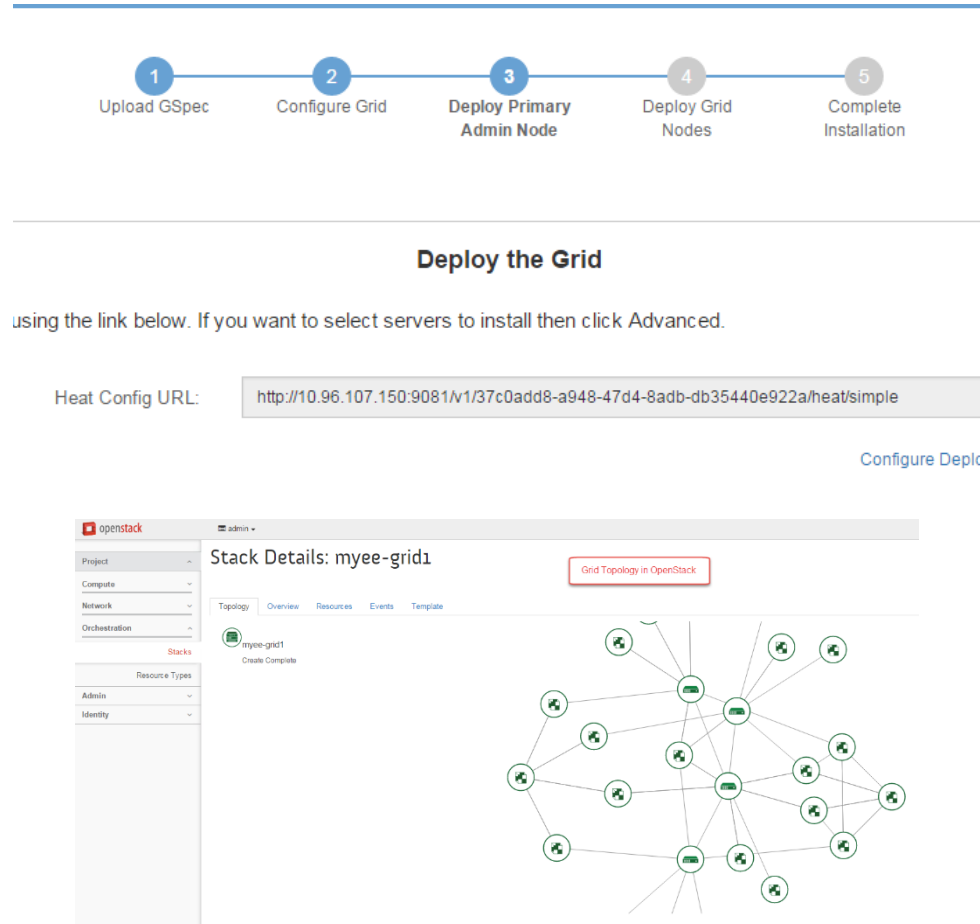| ONTAP®	SolidFire ®	E/EF-Series	StorageGRID®	AltaVault™	OCI

- Manila
- Cinder
- Swift
- Glance

OpenStack and StorageGRID Webscale

Heat deployment

- Featuring heat-orchestrated deployment in OpenStack:
  - Benefits:
    - Fast, automated on-demand deployment
    - A minimal 3-node grid on older hardware takes 20 minutes to deploy
    - Supports KVM
    - NetApp® OpenStack Cinder driver supported (Data ONTAP® and E-Series)
    - Red Hat OSP 7 Kilo reference deployment
      - PVR support for other distributions of OpenStack Kilo
    - First step in migrating StorageGRID® Webscale software to Debian as underlying Linux distribution
- KVM deployment supported under PVR

OpenStack and StorageGRID Webscale

Swift API support

- **Webscale:**
  - Dynamic ILM management of Swift objects
  - Support core API operations
  - Token-based authentication mechanism:
    - Single local admin username/password per account
  - LDAP and Active Directory federated users supported for configured groups:
    - No intra-account access controls
    - Inter-account access not permitted

- **Future support:**
  - Keystone authentication
  - Large object support
  - ACLs, versioning, quotas

数据备份网关

AltaVault and OpenStack

NetApp® SnapProtect®
Arcserve
CA Cloud Storage for System z
Cinder Backup Service
CommVault Simpana
Dell vRanger
EMC NetWorker
HP Data Protector
IBM Spectrum Protect
Veeam
Veritas Backup Exec
Veritas Enterprise Vault
Veritas NetBackup
Microsoft SQL Server
Oracle RMAN

NetApp® AltaVault™

AVA

Service Providers

StorageGRID® Webscale

S3 and Glacier

OpenStack Swift

Cleversafe, Cloudian & Atmos

Seamlessly integrates into existing infrastructure

Deduplicates, compresses, and encrypts

Caches recent backups locally, vaults everything to the cloud

Stores data in the public or private cloud of choice

THANK YOU